

Statistics in focus

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Revision of the weights system for STS data

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A number of monthly indices are provided regularly by the Member States within the context of the Short-term Statistics Regulation (no. 1165/98). During mid-2000 Eurostat carried out a revision of the weights system that is employed in the creation of the short-term statistics database, EBT (European Business Trends).

The work started with the index of production, a leading business cycle indicator, where the weights are based on value added at factor cost. The revision of these weights is used as an example in this document as at the time of writing, the weights were being revised for the other indices, as well as being checked by the Member States.

Revision of the weights during the summer of 2000

Figure 1 shows a comparison between the old and the new weights used to calculate the index of production for EU-15 for total industry. In some cases, for example Italy (12.5% to 14.7%) there were quite large differences in the two sets of weights. This was also the case for the Netherlands (from 4.6% to 3.8%) and the United Kingdom (from 14.6% to 15.6%), whilst for the majority of countries the new weights did not show any significant variation compared to the old ones.

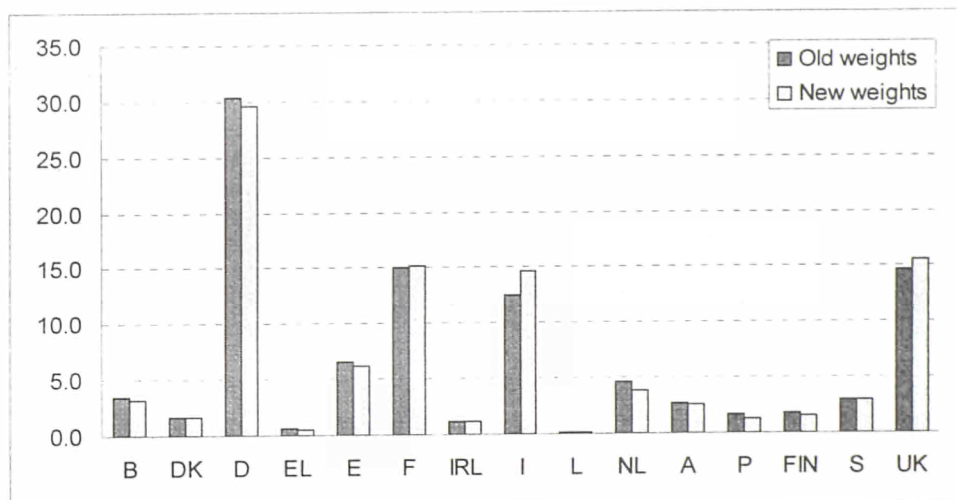


Figure 1: comparison of weights used for total industry for the production index, following the revision exercise conducted during the summer of 2000 (%)*

Source: EBT

* It is important to note that whilst the relative differences in the weights of smaller countries may not vary much, the absolute changes could be considerable.



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Role of weights in European and activity aggregations

Within the EBT database the EU-15 indices are calculated as a weighted average of the national indices, using the shares of each Member State in the EU total.

A similar procedure exists when aggregating to higher levels of the NACE Rev. 1 activity classification. NACE Rev. 1 Groups have to be consistent with the information on Classes, Divisions should likewise be derived from the information on Groups. These procedures continue by aggregating Divisions to Sub-sections and finally Sections. The MIGS (Main Industrial Groupings) are regroupings created from activities corresponding to the 3-digit level of NACE¹.

Each index requires its own set of unique weights based on a relevant indicator. For the index of production, Eurostat uses gross value added at factor costs to calculate the weights. Other indices, such as the employment index are based on their own specific indicator (in this case, the number of persons employed). In the majority of cases, the information is derived from the structural business statistics database, SBS.

It is important to note that whilst the weights need to sum to 100% across countries, it is also necessary that they sum to 100% between different levels of the activity classification. In addition, each level of the NACE Rev. 1 classification requires its own set of weights by country. In other words, the weights for the dairy products industry will be different to those used in the alcoholic beverages industry. The basic formula used in the calculation of aggregates is as follows:

$$Q_{A,t} = \frac{\sum_{b=1}^B VA_{b,0} \times Q_{b,t}}{\sum_{b=1}^B VA_{b,0}}$$

with 0 the base year, VA value added, Q the production index, A the level of aggregation to calculate, and B the sub-levels used for the aggregation (countries or NACE Rev. 1 activities).

Why revise the weights?

Weights are revised as the structure of the economy changes over time. For example, during the last five years the importance of information technology has grown in Europe, whilst the textiles and clothing industries have seen their relative share of economic activity decline. The weights used are generally revised every 5 years. As such there should not be any major structural shift in the composition of the business economy. The recalculation of the weights normally coincides with the re-basing of the indices, with base year values being set to 100.

However, weights already existed in the EBT database for 1995 - as this task was first carried out in early 1999 when switching base year. The original set of 1995 weights were based on somewhat incomplete information, with many missing data filled with estimates. Given that far more complete information has subsequently become available within the SBS database, following the implementation of the SBS Regulation, Eurostat decided that it would be beneficial to revise the 1995 weights. Whilst many of the previous estimates can be replaced with official data, there remains a considerable amount of estimation work to fill missing data. In order to have more reliable information, the revision exercise is being carried out in close collaboration with the Member States, which are, in some cases, providing extra data to complete the weights tables. One of the positive results of the revision process is that the activity coverage of some indices will grow substantially. This is the case for new orders, which was available for just the manufacturing total, but has recently become available across the majority of industrial activities.

¹ The definition of the MIGs was voted at the Statistical Programme Committee in November 2000. This summary classification comprises five categories: energy, intermediate goods, capital goods, consumer durables and consumer non-durables.

The extent of changes

The major benefit of revising the weights should be seen at lower levels of aggregation, when more detailed NACE Rev. 1 activities are being studied. This is mainly due to the greater availability of structural data used to produce the weights, as well as the co-operation of the Member States in revising the estimates for missing structural data. Figures 2 and 3 show plots of the production index before and after the revision of the weights for total industry and the manufacture of rubber and plastic products (a 2-digit NACE Rev. 1 activity). As one can see, the differences recorded for the total industry aggregate are small in size, whilst at lower levels of NACE there may be larger changes observed in the levels of the respective indices.

Activity	Index
Total industry	Production
Total industry	Producer price index
Total industry	New orders
Total industry	Wages and salaries
Total industry	Employment
Construction	Production
Retail trade	Turnover

Box 1: indicators used to derive the weights in the STS database

Source: EBT

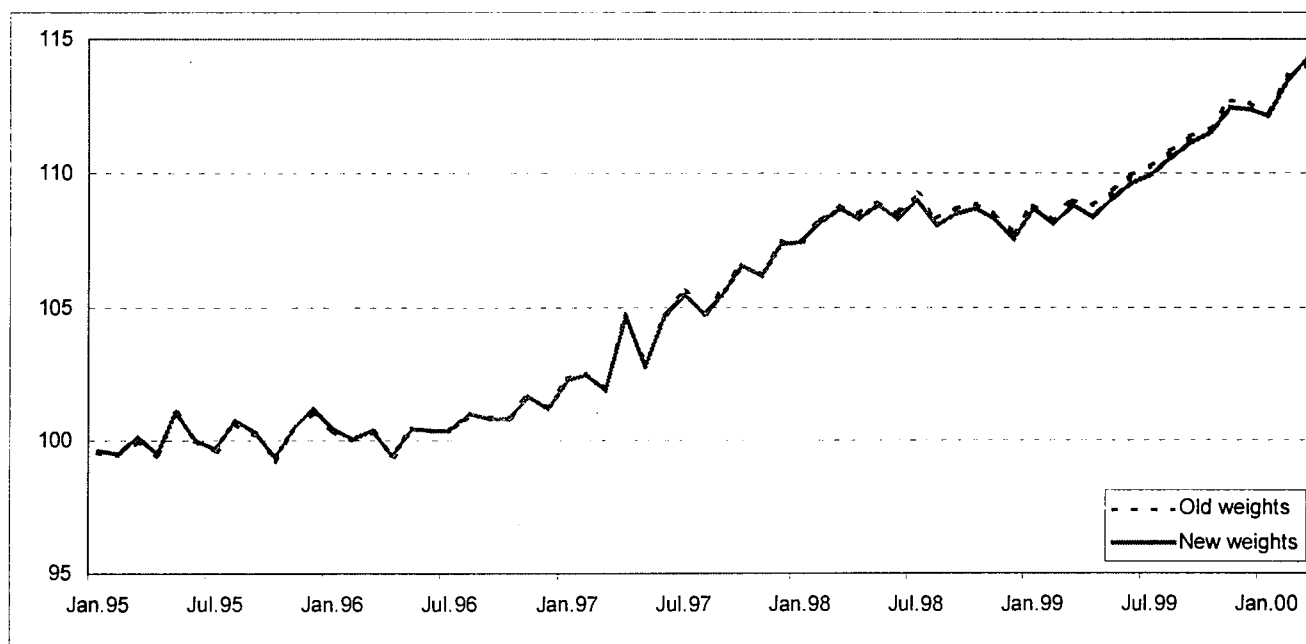


Figure 2: production index for total industry, EU-15 (1995=100)

Source: EBT

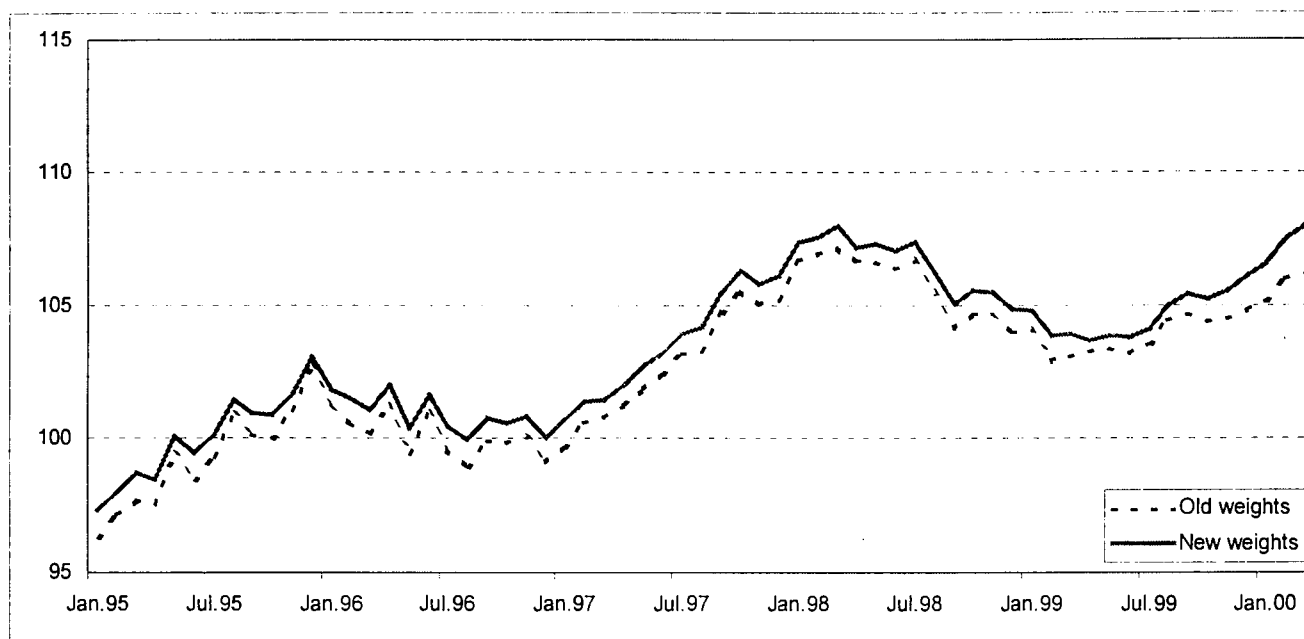


Figure 3: production index for the manufacture of rubber and plastic products, EU-15 (1995=100)

Source: EBT

Table 1 shows a summary of the differences observed in the value added weights at different levels of the activity classification. The absolute value of the difference between the new weights and the old weights was calculated for total industry (first column) and for each NACE Rev. 1 heading at the most detailed level of the activity breakdown available (second column)².

There is a clear difference in the scale of the revisions across different levels of the activity classification. Italy, the Netherlands and the United Kingdom reported some of the largest changes in terms of the weights for total industry. At more detailed levels of the NACE Rev. 1 classification there were also substantial revisions of the respective weights for Germany

and France. Changes in the weights of Spain, Ireland and Portugal may in part be explained by a structural shift in production away from the larger EU economies towards these Member States.

Country	Total industry	Detailed NACE breakdown
B	0.36	2.23
DK	0.09	0.73
D	0.75	5.19
EL	0.06	0.50
E	0.36	2.11
F	0.05	3.81
IRL	0.02	1.35
I	2.22	7.61
L	0.01	0.25
NL	0.77	3.14
A	0.11	2.28
P	0.44	1.73
FIN	0.20	0.76
S	0.04	0.69
UK	0.94	3.64

Table 1: average absolute differences observed between the new weights and the old weights (%)^{*}

Source: EBT

² Usually 3- or 4-digit NACE Rev. 1 headings.

^{*} It is important to note that whilst the relative differences in the weights of smaller countries may not vary much, the absolute changes could be considerable.

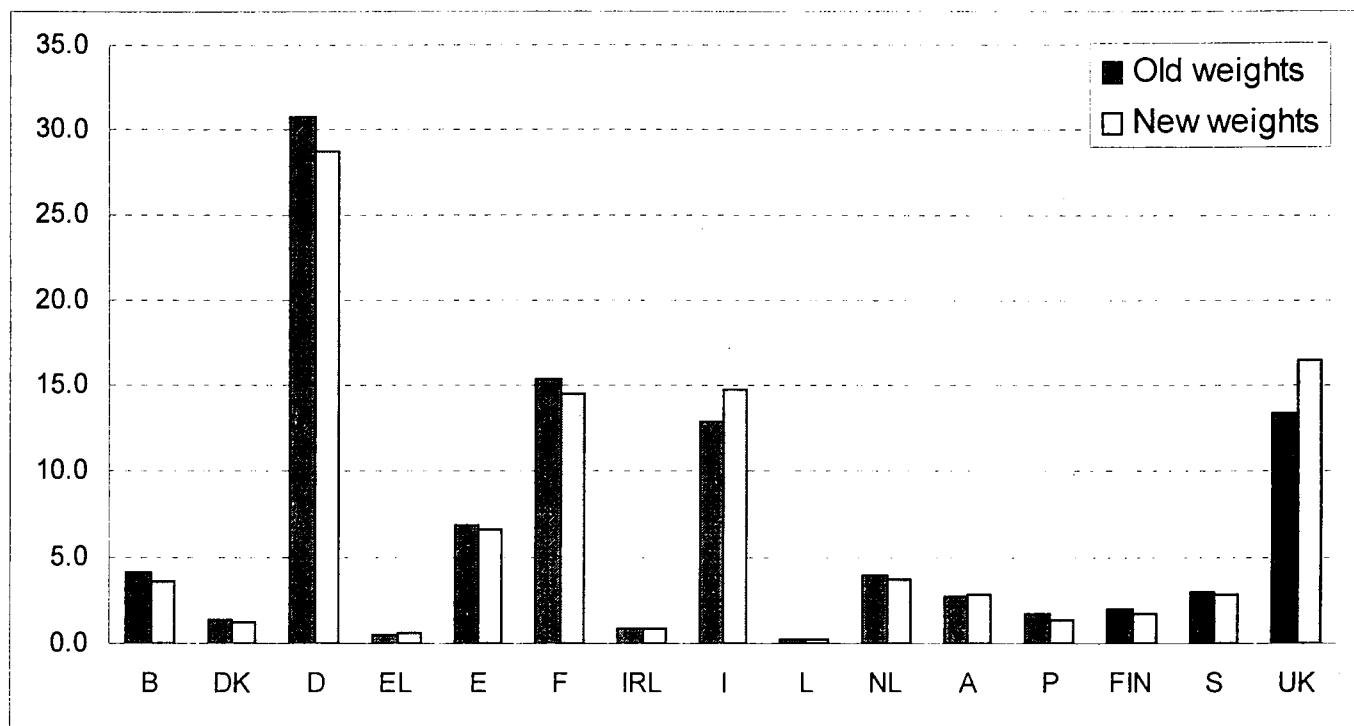


Figure 4: comparison of weights used for intermediate goods for the production index, following the revision exercise conducted during the summer of 2000 (%)*

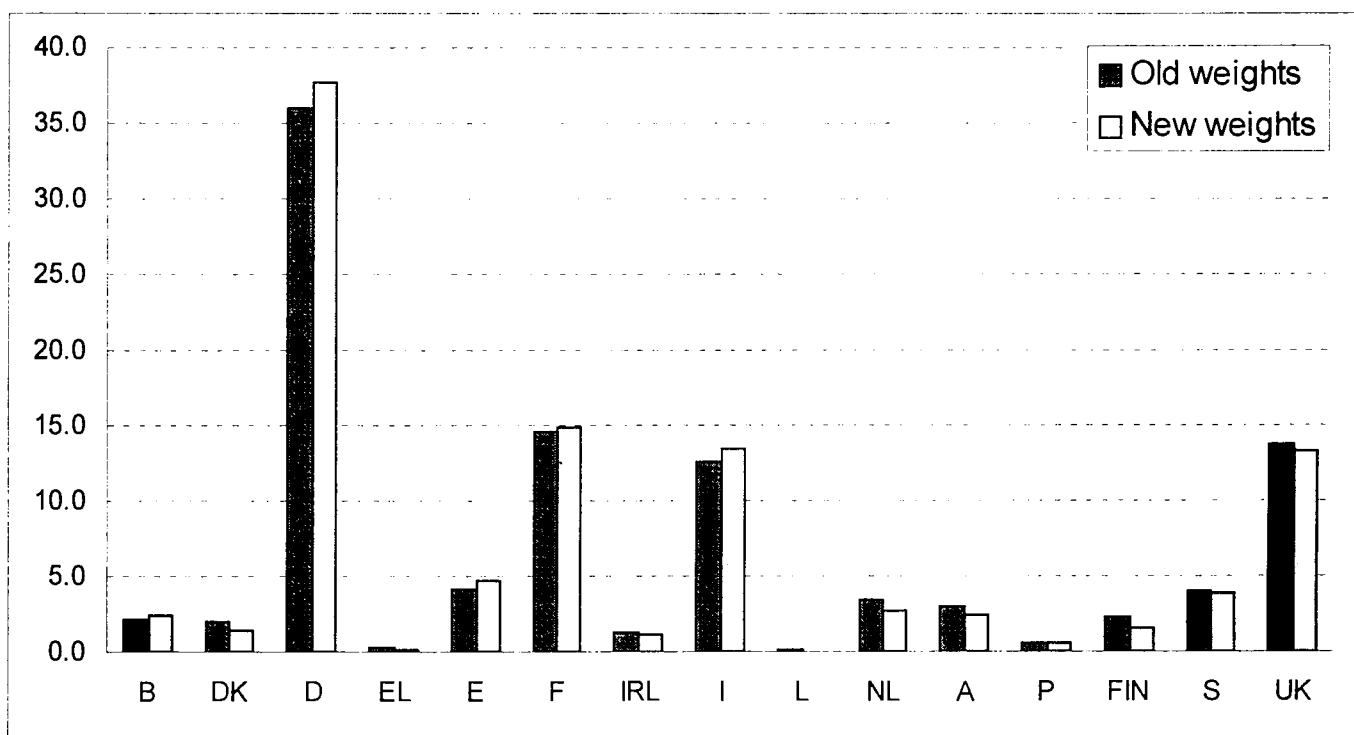


Figure 5: comparison of weights used for capital goods for the production index, following the revision exercise conducted during the summer of 2000 (%)*

* It is important to note that whilst the relative differences in the weights of smaller countries may not vary much, the absolute changes could be considerable.

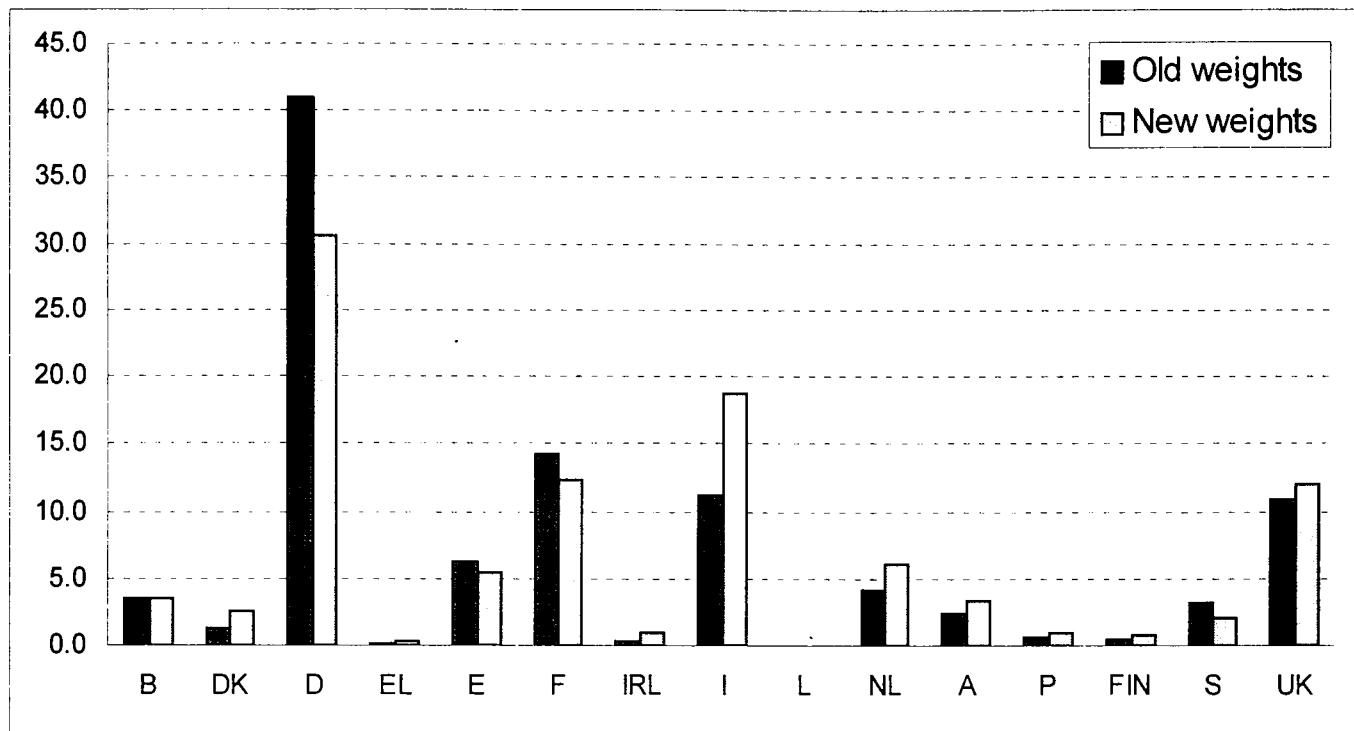


Figure 6: comparison of weights used for durable consumer goods for the production index, following the revision exercise conducted during the summer of 2000 (%)*

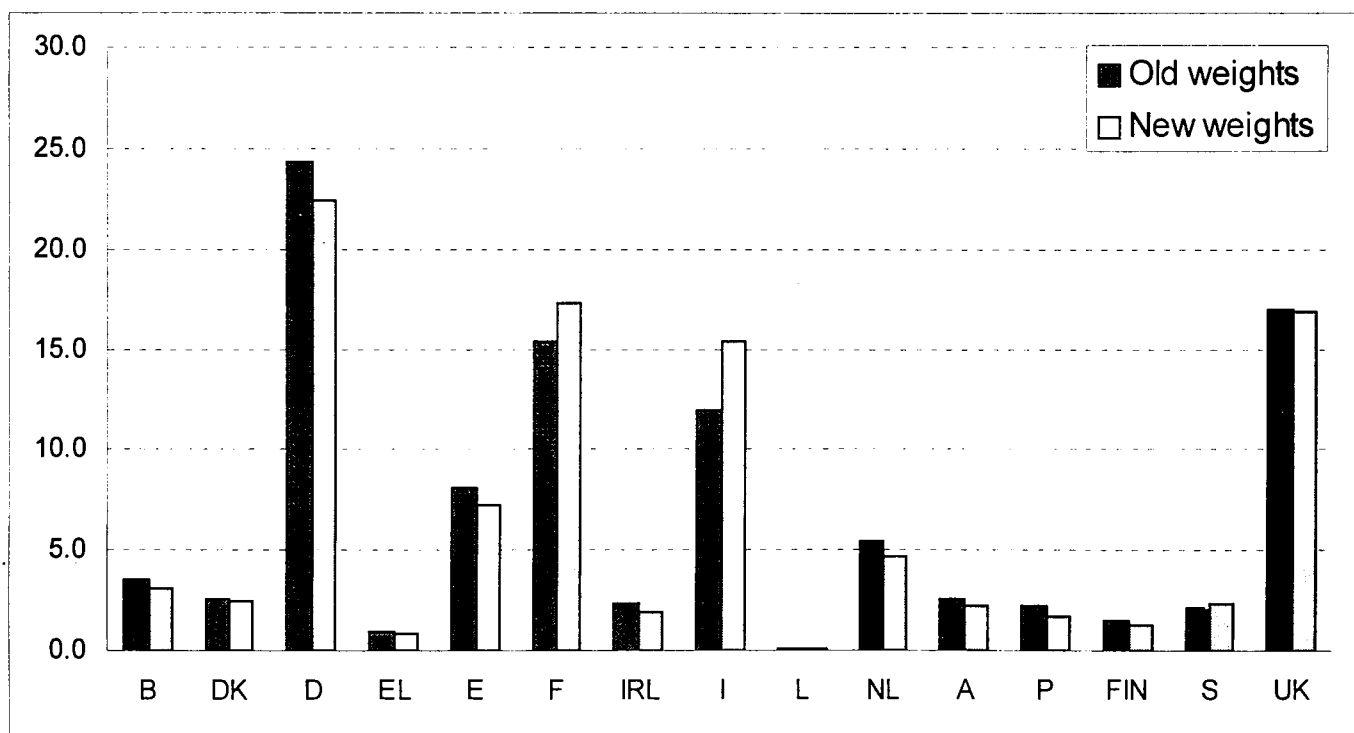


Figure 7: comparison of weights used for non-durable consumer goods for the production index, following the revision exercise conducted during the summer of 2000 (%)*

* It is important to note that whilst the relative differences in the weights of smaller countries may not vary much, the absolute changes could be considerable.

Country	Production index for total industry	Producer price index for total industry	Employment index for total industry	Production index for construction	Turnover index for retail trade
B	3.2	2.7	2.4	3.6	3.3
DK	1.6	1.2	1.8	1.8	1.8
D	29.6	27.5	26.9	32.6	24.8
EL	0.6	0.8	1.0	0.7	1.1
E	6.2	7.5	7.8	9.6	8.2
F	15.1	17.0	14.1	15.1	18.1
IRL	1.2	0.6	0.8	0.3	0.8
I	14.7	17.4	16.8	12.5	13.0
L	0.2	0.1	0.1	0.3	0.2
NL	3.8	3.0	3.3	5.0	4.5
A	2.6	1.9	2.3	3.4	2.5
P	1.2	1.5	3.3	1.3	1.4
FIN	1.6	1.4	1.4	0.9	1.3
S	2.9	2.3	2.4	1.6	2.6
UK	15.6	15.2	15.5	11.2	16.4

Table 2: new weights for leading indicators within the EBT database, as implemented during the summer and autumn of 2000 (%)

Source: EBT

➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Some important methodological issues are linked with the production and publication of the weights. To calculate activity and geographical aggregates it is necessary to have a complete set of weights available. Some of the structural data involved in the calculation of these weights is confidential. This is especially the case for smaller countries or detailed NACE Rev. 1 activities. The publication of these weights could make it possible to disclose confidential information and for this reason only the indices are published and not the weights themselves. The verification of weights used in the EBT database has been carried out with each Member State separately.

A second type of problem is linked to monetary conversions. The structural data used to calculate the weights is usually expressed in ECU terms. The data was originally converted using the average 1995 exchange rates. Before the parities with the euro were fixed, some of these exchange rates were subject to relatively high variability. This was particularly the case for Italy and the United Kingdom. To "correct" the exchange rates, an adjustment was

made by dividing the 1995 average exchange rates by the average for the period 1993-1997 and applying this correction coefficient to the whole series.

There were some common problems across countries that were faced when estimating missing structural data to complete the set of weights. Typical problems included:

1. Data missing for 1995 but available for 1996 or 1997. In these cases the internal structure of a given activity such as, for example, shares of 4-digit activities in 3-digit aggregates was derived from the more recent years and applied to the available 1995 data.
2. In some cases, where data for a particular activity was not available, the shares were calculated on a different country under the hypothesis of a similar economic structure.

3. Some data was only available for enterprises with 20 or more persons employed. This problem appeared for 1995, and it was generally possible to find alternative structural data from more recent years, 1996 or 1997, covering enterprises of all size classes.

4. The variable used to calculate the weights was sometimes not available. In some cases it was possible, in agreement with the Member States, to use a proxy variable, for example value added at basic prices instead of value added at factor cost. Generally a ratio was calculated between the two variables from other countries that provided data and this ratio was applied as a correction coefficient to the original series.

In general the exercise proved useful as it improved co-operation with the Member States and led to increased transparency in the calculation of the short-term indices, whilst also resulting in higher quality and more standardised data.

Further information:

➤ Reference publications

Title Monthly Panorama of European Business - Annual subscription
Catalogue No KS-AM-00-000-EN-C Price EUR 162

➤ Databases

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